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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/735,369

12/12/2003

John Frederick Ackerman

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(21635-0117)

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06/28/2005

EXAMINER

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ART UNIT

PAPER NUMBER

1762

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/735,369

Applicant(s)

ACKERMAN ET AL.

Examiner

Katherine A. Bareford

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

The amendment of May 23, 2005 has been received and entered. The Examiner notes that applicant's amendment was mistakenly provided with the serial number of 10/753,369. Please note that the correct number is 10/735,369.

#### *Claim Rejections - 35 USC § 112*

1. The rejection of claims 1-20 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is withdrawn due to applicant's amendments to the specification and arguments of May 23, 2005.

#### *Claims*

2. After the amendments to paragraphs [0018] and [0035] of the specification, clarifying the terminology, the Examiner understands that the "atomic ratio of the amount of the first element to the amount of the second element is at least 1:3" as claimed by applicant in independent claims 1, 12 and 20 to mean that ratios of 1:3 and ratios where atoms of the first element are more, proportionally, than that amount are included. For example, ratios of 1:2, 1:1, 2:1 and 3:1 would all be included, while ratios of 1:4, 1:5, 1:6, etc. would not. If applicant disagrees, he should so state on the record.

#### *Double Patenting*

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent

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and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1, 2, 5-12 and 15-20 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 14-18 of U.S.

Patent No. 6,887,588. Although the conflicting claims are not identical, they are not patentably distinct from each other because '588 teaches all the features of these claims except that (1) of the listed inhibitor material, one of group 2 or 3 of the periodic table and one of group 5 of the periodic table are selected, (2) that the thermal barrier material is a ceramic such as yttria stabilized zirconia and the substrate nickel base superalloy, and (3) that ratios of the inhibitor materials. However, as to the selection of the inhibitor materials, '588 provides that one or more of the listed materials can be selected, which would include selection of one of group 2 or 3 of the periodic table (from the listed materials) and one of group 5 of the periodic table (from the listed materials). As to the use of yttria stabilized zirconia as the thermal barrier material and nickel base superalloy as the substrate, it is the Examiner's position that it is well known in the art of thermal spraying and turbine use that the thermal barrier material should

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commonly be well known to be yttria stabilized zirconia and the substrate be a nickel base superalloy. As to the atomic ratio, the claims teach to select one or more from the listed inhibitor materials, and one of ordinary skill in the art would provide routine experimentation to optimize the amounts of each material to be used such that desirable inhibition is provided.

✓D \*\*\* This rejection is now <sup>an</sup> ~~in~~ obvious-type double patenting rejection, because 09/957,843 with its conflicting claims, has now issued as U.S. patent 6,887,588. \*\*\*

5. In the amendment of May 23, 2005, applicant argues that 09/957,843 (now US patent 6,887,588) does not provide a teaching of the claimed ratio limitation in the present claims. Applicant argues that one would not use routine experimentation to supply the limitation, because as noted in MPEP 2144.05 II B, a particular parameter must first be recognized as a result effective variable before determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. In this case, applicant argues that the prior art does not recognize that the ratios as claimed are a result effective variable, and thus, the double patenting rejection should not have been made.

The Examiner has reviewed this argument, however, the rejection is maintained. While a parameter must be recognized as a result effective variable before determination of the optimum or workable ranges, one of ordinary skill in the art would clearly recognize that from the list of possible mixtures of materials present by

'588 in the claims, that routine experimentation would be needed to indicate which mixtures provided desirable sintering inhibition. As discussed by '588 in column 8, lines 35-45, mixtures can be used "as long as the reaction products meet the other requirements set forth herein". As a result of performing this routine experimentation, mixtures within the claimed ratio would be determined. Thus, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Applicant has made no showing in the amendment or in the specification as filed that the claimed ranges are critical.

#### *Claim Rejections - 35 USC § 103*

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ackerman et al (US 2003/0059633).

Claim 1, 12, 20: Ackerman teaches a method for preparing a protected article. Figure 2 and paragraph [0001]. The article is provided. Figures 2-3 and paragraph [0020]. A bond coat is deposited onto an exposed surface of the article. Figures 2-3 and paragraph [0025]. A thermal barrier coating is provided on an exposed surface of the bond coat. Figures 2-3 and paragraphs [0028] and [0032]. The thermal barrier coating provides depositing a primary ceramic coating onto the bond coat. Figures 2-3 and paragraph [0028]. A stabilization composition is deposited onto an exposed surface of the primary ceramic coating. Figures 2-3 and paragraphs [0032]--[0034]. The stabilization composition can be made of two elements. Paragraphs [0032]--[0034] (mixtures of the listed materials can be used). The first element can be from Group 2 or 3 of the periodic table. Paragraphs [0032] -- [0034] (lanthanum, neodymium). The second element can be from Group 5 of the periodic table. Paragraphs [0032] -- [0034] (niobium, tantalum).

Claim 2, 12: the article can be a nickel base superalloy article. Paragraph [0020].

Claim 3: the article can be component in a gas turbine engine. Paragraph [0020].

Claim 4, 14: the bond coat can be a diffusion aluminide or an aluminum containing overlay bond coat. Paragraph [0025].

Claim 5, 12: the primary ceramic can be yttria stabilized zirconia. Paragraph [0028].

Claim 6, 15: the first element can be lanthanum or neodymium. Paragraphs [0032] – [0034].

Claim 7, 16: the second element can be tantalum or niobium. Paragraphs [0032] – [0034].

Claim 8, 17: the composition can be a grouping of lanthanum and tantalum, neodymium and tantalum, etc. Paragraphs [0032] – [0034], as the mixtures can be used.

Claim 9, 18: the first and second elements can be co-deposited. Paragraph [0036] (when more than one element used, they are applied at the same time).

Claim 10: the first and second elements can be co-deposited from a liquid solution. Paragraph [0036].

Claim 13: the yttria stabilized zirconia can be 7 percent yttria by weight. Paragraphs [0028] and [0042].

Ackerman teaches all the features of these claims except the atomic ratio of the amount of the first element to the second element.

However, Ackerman does teach that mixtures of the materials can be used as long as the reaction products meet the other requirements set forth. Paragraph [0034].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ackerman to perform routine experimentation to optimize the amount of each element to be used when using a mixture of materials,



because Ackerman teaches that when mixtures are used, the other requirements set forth in the patent must be met, and thus one of ordinary skill in the art would optimize the mixtures to be sure that the required features of Ackerman are met.

9. Claims 1-12 and 14-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subramanian et al (US 6677064).

Claim 1, 12, 20: Subramanian teaches a method for preparing a protected article. Column 1, lines 10-15. The article is provided. Figures 2-4 and column 3, line 65 through column 4, line 10. A bond coat is deposited onto an exposed surface of the article. Figures 2-4 and column 4, lines 10-40. A thermal barrier coating is provided on an exposed surface of the bond coat. Figures 2-4 and column 4, lines 35-60 and column 5, lines 40-68. The thermal barrier coating provides depositing a primary ceramic coating onto the bond coat. Figures 2-4 and column 4, lines 45-60 (yttria stabilized zirconia, for example). A stabilization composition is deposited onto an exposed surface of the primary ceramic coating. Figures 2-4 and column 5, lines 40-50 and 60-68. The stabilization composition can be made of two elements. Column 5, lines 60-68 (mixtures of two listed materials can be used). The first element can be from Group 2 or 3 of the periodic table. Column 5, lines 60-68 (lanthanum (La), neodymium (Nd), yttrium (Y), cerium(Ce)). The second element can be from Group 5 of the periodic table. Column 5, lines 60-68 (niobium (Nb), tantalum (Ta)).

Claim 2, 12: the article can be a nickel base superalloy article. Column 4, lines 5-10.

Claim 3: the article can be component in a gas turbine engine. Column 3, lines 45-65.

Claim 4, 14: the bond coat can be an aluminum containing overlay bond coat. Column 4, lines 10-40.

Claim 5, 12: the primary ceramic can be yttria stabilized zirconia. Column 4, lines 45-60.

Claim 6, 15: the first element can be lanthanum or neodymium. Column 5, lines 60-68.

Claim 7, 16: the second element can be tantalum or niobium. Column 5, lines 60-68.

Claim 8, 17: the composition can be a grouping of lanthanum and tantalum, neodymium and tantalum, etc. Column 5, lines 60-68, as the mixtures can be used.

Claim 9, 18: the first and second elements can be co-deposited. Column 5, lines 40-50 (when more than one element used, they are applied at the same time).

Claim 10: the first and second elements can be co-deposited from a liquid solution. Column 5, lines 40-50 (sol-gel would be liquid).

Subramanian teaches all the features of these claims except the atomic ratio of the amount of the first element to the second element.

However, Subramanian does teach that the materials are advantageously selected based on their phase stability and possible reaction products. Column 7, lines 10-20. The reaction products are desired to have a low tendency to sinter. Column 7, lines 10-20

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Subramanian to perform routine experimentation to optimize the amount of each element to be used when using a two part mixture of materials, because Subramanian teaches that materials should be selected for their possible reaction products, phase stability and low tendency to sinter, and thus one of ordinary skill in the art would optimize the mixtures to be sure that the required features of Subramanian are met.

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Subramanian as applied to claims 1-12 and 14-20 above, and further in view of Taylor et al (US 5520516).

Subramanian teaches all the features of these claims except that the primary ceramic coating is of yttria stabilized zirconia with 7 percent yttria by weight.

However, Taylor teaches applying a yttria stabilized zirconia coat onto a bond coating on a gas turbine engine component. Column 5, lines 20-40. The zirconia coat is desirably 7 percent yttria by weight. Column 5, lines 20-40.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Subramanian to use yttria stabilized zirconia with 7 percent yttria by weight as the primary ceramic as suggested by Taylor to provide a desirable coating system because Subramanian teaches that yttria stabilized zirconia can be used on turbine components, and Taylor teaches that a desirable percentage of yttria in zirconia when coating yttria stabilized zirconia on turbine components is 7 percent by weight.

#### *Response to Arguments*

11. Applicant's arguments filed May 23, 2005 have been fully considered but they are not persuasive.

In the amendment of May 23, 2005, applicant argues that neither Ackerman or Subramanian provides a teaching of the claimed ratio limitation in the present claims. Applicant argues that one would not use routine experimentation to supply the limitation, because as noted in MPEP 2144.05 II B, a particular parameter must first be recognized as a result effective variable before determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. In this case, applicant argues that the prior art does not recognize that the ratios as claimed are a result effective variable, and thus, the rejection should not have been made.

The Examiner has reviewed this argument, however, the rejection is maintained. While a parameter must be recognized as a result effective variable before

determination of the optimum or workable ranges, one of ordinary skill in the art would clearly recognize that from the list of possible mixtures of materials present by Ackerman or Subramanian, that routine experimentation would be needed to indicate which mixtures provided desirable sintering inhibition. As discussed by Ackerman in paragraph [0034], mixtures can be used "as long as the reaction products meet the other requirements set forth herein". Furthermore, Subramanian teaches that the materials are advantageously selected based on their phase stability and possible reaction products, which are desired to have a low tendency to sinter (column 7, lines 10-20). As a result of performing this routine experimentation, mixtures within the claimed ratio would be determined. Thus, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Applicant has made no showing in the amendment or in the specification as filed that the claimed ranges are critical.

### ***Conclusion***

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
KATHERINE BAREFORD  
PRIMARY EXAMINER